V04 IMERG Final Run Release Notes

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21 March 2017, rev.

The algorithm for the Integrated Multi-satellitE Retrievals for GPM (IMERG) has now been upgraded to Version 04. The transition to V04 for the IMERG Final Run is planned for 22 March at PPS and the new data should start flowing down to the GES DISC as well. Access (detailed below) and data fields continue to be the same as for Version 03, except the version number is 04A. Initially, the data record begins with 12 March 2014 and runs to May 2015. Note that the March 2014 monthly file is based the partial month of data starting with 12 March. Additional processing over the next few weeks will bring the data to its (new) nominal latency of about 2.5 months after the observations. Version 04 supersedes all prior IMERG versions, and users are urged to shift to the new datasets as soon as practical.

Changes from Version 03 to 04

- Use GPROF V04 to compute precipitation estimates for all microwave sensors as input.
- Threshold GPROF V04 precipitation rates for all input precipitation estimates to adjust fractional coverage; thresholds are sensor-dependent.
- Add GPROF-ATMS precip estimates (not used in V03).
- Dynamically calibrate PERSIANN-CCS to the IMERG "high quality" (HQ) merged microwave field for a closer match to HQ data behavior by the IR estimates.
- Calibrate 2BCMB to GPCP V2.3 over ocean (at middle and high latitudes) and land (globally) to compensate for low (high) 2BCMB bias over non-tropical oceans (land).
- Increase HQ precipitation field spatial coverage from 60°N-S to 90°N-S.
- Threshold HQ at 50 mm/hour to accommodate a legacy precipitation encoding limitation.
- Average the four 1° grid box adjustment coefficients to calibrate GPROF-GMI to 2BCMB in each IMERG 0.1° grid box to eliminate blockiness in regions of high gradient differences.
- Correct the bug that incorrectly assigned 1/3 Kalman weighting to IR in certain instances.
- Correct the bug that erroneously shifted the Kalman estimate one grid box to the north.
- [Final only] Screen offshore GPCC influence to eliminate blockiness on the oceanward side of coastal zones.
- [Final only] Rework use of ECMWF file to create Prob. of Liq. Phase Precip. to avoid use of following month's data, and so decrease latency.
- [Final only] Remove GPCC grid box volume adjustment to eliminate blocky gauge adjustment.

Additional Access Information

The data archive sites will be working to populate the various repositories of original and value-added data with the new Version 04. See *https://pmm.nasa.gov/data-access/downloads/gpm* to find all of the various formats and their locations. Recall that access to the various systems (PPS, PPS near-real time, and GES DISC) requires separate simple, free, and automatic registrations to satisfy NASA data system requirements.

IMERG Final Run data are computed about 2.5 months after observation time, a month at a time. The native HDF5 half-hourly products have the prefix "*3B-HHR*", while the monthly products

have the prefix "*3B-MO*". Note that the monthly product is only available for the Final Run. The complete file naming convention can be found at

http://pps.gsfc.nasa.gov/Documents/FileNamingConventionForPrecipitationProductsForGPMMissionV1.4.pdf .

The version number for the initial release is Version 04A. The field named *precipitationCal* contains the "complete" IMERG precipitation estimate.

Additional Notes

Recall that the Final Run uses calibrations based on accumulations of match-ups that are centered (in time) on the month, while Early and Late Runs necessarily use calibrations based on trailing accumulations of match-ups, since these cannot be computed into the future. In addition, the Early Run only has forward propagation of the microwave data (unlike both the Late and Final Runs), and neither has calibration to the monthly gauge data as in the Final Run. Both the Early and Late Runs are using "seed" calibration files from October 2015 for the Kalman coefficients and from March 2015 for the 2BCMB-GMI and HQ-IR calibrations. Accordingly, users should expect the starts of the records to be less accurate than following months of data that will have fully populated recent calibrations. By contrast, the Final Run does not require a seed file, since enough data exists in March 2014 to approximately fill the (centered) accumulation files. Validation results will be posted as they are developed.

The V04 IMERG Early and Late Runs were released in early March with an initial start date of 5 February 2017. Work is ongoing to retrospectively process these back to the start of GPM in April 2014. All three runs will be retrospectively processed back to the start of the Tropical Rainfall Measuring Mission (TRMM), 1998 (or 2000, depending on some data issues), in late 2017 or early 2018.